

2. On a Collection of Lizards from the Malay Peninsula, made by Members of the "Skeat Expedition," 1899-1900. By F. F. LAIDLAW, B.A., Assistant Lecturer and Demonstrator at Owens College.

[Received March 14, 1901.]

(Text-figure 76.)

I. Native names of the Lizards.

The small House-Geckos are known to the Malays as "chi-chak" ("chee-chak"). *Gecko verticillatus* is called "tokay." The different members of the genus *Varanus* are called "biawak" or "bewak" (biāwah). *Liolepis bellii* is the "bewak pasir" (sand-lizard); *Gecko stentor* the owl lizard, "bewak pongo." *Draco* is often spoken of as "chichak terbang" or flying lizard, sometimes "bidadari" (fairy or celestial spirit), occasionally by way of a joke "bidandari" (bidan=midwife). The species of *Calotes* and *Gonodactylus* are called "sumpah-sumpah" in the south, farther north "pōkah." The Skinks are called "bengkarong" (or "mengkarong"), except *Lygosoma chalcides*, which is regarded as a snake and called "ular berkaki," the snake with feet, or "ular bengkarong," lizard-like snake. *Tychodromus seolineatus*, on the other hand, is "bengkarong ular," the snake-like lizard.

II. Distribution of the Lizards¹.

The distribution of Lizards throughout the Peninsula is of course modified by the physical characters of the country. Thus along the east coast, where there are large tracts of barren sandy country, *Liolepis bellii* is exceedingly abundant and in such localities is the only reptile to be seen. This lizard is the only example from the Peninsula of the terrestrial group of Agamoids, so numerous in Australia and Africa, and it is interesting to find that it keeps to the driest and most exposed places to be found.

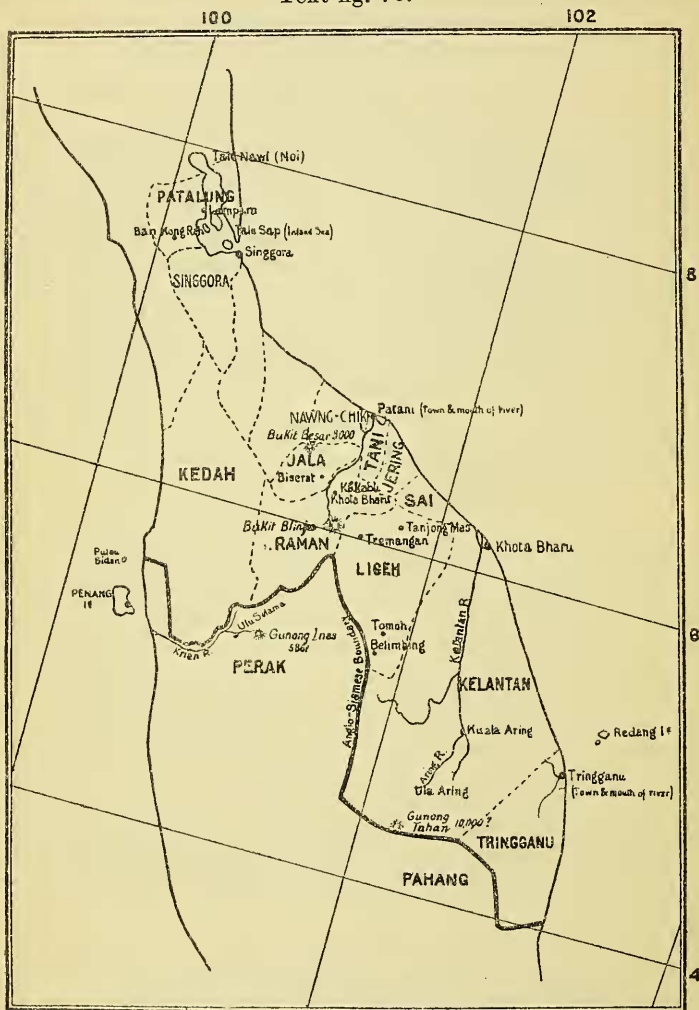
A number of species are only to be found in the cultivated lands lying alongside the rivers and spreading out over the plains. *Calotes cristatellus* is certain to be met with wherever there are groves of cocoanut, palms, or banana plants. The common species of *Varanus* too are abundant, sometimes they are to be seen right in the towns. I shot a specimen of *V. salvator* well over 5 feet in length at the back of our house in Tringgannu, where it was feeding on a dead pig.

Draco volans is also found in cultivated lands; in the north *Gecko verticillatus*, which does not live in houses in the Peninsula, is sometimes to be met with under the bark of trees along with *Hemidactylus frenatus*. The most widely spread of all is perhaps *Mabuia multifasciata*, equally at home in the thickest forests and in towns within a few feet of high-water mark. The small house-haunting Geckos complete the Lizard-fauna of the cultivated

¹ The position of the localities in which specimens were collected is shown in the sketch-map, text-fig. 76, p. 302.

country. It will be noticed that all these species have a wide range in the Oriental region. On the other hand, the forest fauna consists for the most part of species with a limited range. The most characteristic genus of Lizards inhabiting this part of the

Text-fig. 76.



Map of part of the Malay Peninsula, to show the localities mentioned in the text.

world is certainly *Draco*, and the distribution of its various species is interesting as bearing on the general question of the distribution of the Malayan fauna. Mr. Boulenger (Cat. Liz. Brit. Mus. i. p. 253) divides the genus into two main groups—one with the

nostrils directed laterally, the other with the nostrils directed vertically upwards. The former group has a wide range. On the mainland, *D. maculatus* ranges from Yunnan to Singapore; in Hainan it is replaced by the closely allied *D. whiteheadi*. Next come two species common to the Malay Peninsula and the three great Malay Islands, viz. *D. volans* and *D. fimbriatus*. *D. punctatus* is known from Borneo and the Peninsula, and there are three species confined to Borneo: these are *D. cornutus*, *D. rostratus*, and *D. cristatellus*. Eastwards, *D. lineatus* has been recorded from the Moluccas and doubtfully from Java. Four species are known to inhabit Celebes: one of these, *D. reticulatus*, occurs also in the Philippines, which have also six or seven 'precinctive' species. Lastly, *D. walkeri* and *D. timorensis* are found in Timor. On the other hand, the second group does not extend farther east than Java. It may conveniently be divided into two sub-groups: in one the gular pouch of the males is covered with very large scales, in the second the scales on the pouch are not enlarged.

The first sub-group contains four species, these are:—

D. blanfordi, from Tenasserim to Perak (Larut Hills).

D. tæniopterus, Tenasserim and Siam.

D. formosus, Perak and Penang.

D. obscurus, Borneo.

D. formosus is intermediate in structure between the first two species.

Of the second sub-group, *D. dussumieri* is found in India; all the others are from Borneo, but some range into Java, Sumatra, and the Malay Peninsula:—

Borneo.	Java.	Sumatra.	Peninsula.
<i>D. maximus</i> .			
<i>D. affinis</i> .			
<i>D. quinquefasciatus</i> .			<i>D. quinquefasciatus</i> .
<i>D. micropterus</i> .			
<i>D. hæmatopogon</i> .	<i>D. hæmatopogon</i> .	<i>D. hæmatopogon</i> .	
<i>D. melanopogon</i> .			<i>D. melanopogon</i> .

On the whole the Peninsula comes nearer to Borneo than do any of the other neighbouring countries; the other Agamoid lizards support this view strongly. The genus *Aphaniois* is common to Borneo and the Peninsula, and not found in Java or Sumatra. The last-named island, on the other hand, has the precinctive genus *Phoxophrys*, and one species of the genus *Cophotis*, of which the other species is found in Ceylon, and belongs to a small group of three genera with processes on the snout otherwise peculiar to Ceylon. Java has the precinctive genus *Harpesaurus*, and is inhabited by *Lophurus amboinensis*, an eastern form belonging to that group of Agamoids furnished with femoral pores.

There remain for consideration three large genera widely distributed in the Oriental region. One of these, *Acanthosaura*, is entirely continental and reaches its southern limit in the Peninsula. The second, *Gonyocephalus*, is chiefly found in the archipelago, as far east as N. Guinea; this genus is represented in the

Peninsula. Lastly the genus *Calotes*, more widely spread than either of the preceding, is poorly represented in the south of the Peninsula by but one species *C. cristatellus*, but more abundantly both to the north and in the neighbouring islands.

It is worth remarking that I have never seen a really young specimen of any *Draco*; whilst young examples of *Aphanotis fusca* and *Gonyocephalus borneensis* seem to be more frequently caught than adults.

III. *Systematic List of the Species, with Notes.*

Fam. GECKONIDÆ.

GYMNODACTYLUS MARMORATUS (Kuhl).

Gymnodactylus marmoratus, Boulenger, Cat. Liz. i. p. 44; S. S. Flower, P. Z. S. 1899, p. 626.

I caught a young specimen of this lizard under a large stone in the Botanical Gardens at Penang, about 300 ft. above sea-level, a large one at the foot of Gunong Inas from under a boulder, and a young one at Kuala Aring in a dead bamboo.

GYMNODACTYLUS PEGUENSIS Blgr.

Gymnodactylus peguensis, Boulenger, Ann. Mus. Genov. (2) xiii. p. 314, pl. vi. fig. 2.

One specimen, an adult male, was collected in Patalung by Mr. Annandale, who tells me that he saw another individual of the same species on a hill in Legeh.

This is certainly one of the most beautiful of lizards. The following is a brief description of our specimen:—Head ovoid, covered above with very small granules, largest on the snout. Forehead concave. Ear-opening small, oblique, and oval in shape. The back is covered with small granules; scattered amongst these are numerous small trihedral tubercles. The scales on the are very small, those of the belly considerably larger and somewhat imbricate. Eight pre-anal pores. Ground-colour a delicate brownish pink; on the dorsal surface are large patches of rich dark brown, darkest at the margins and unsymmetrically arranged. Tail with black rings.

Length of head.....	20 mm.
„ body.....	45 „
„ tail	60 „
„ fore limb	26 „
„ hind limb.....	32 „
Breadth of head	13 „

GONATODES KENDALLI (Gray).

Gonatodes kendalli, Boulenger, Cat. Liz. i. p. 63; S. S. Flower, P. Z. S. 1896, p. 863; id. P. Z. S. 1899, p. 627.

One specimen from Bukit Timah, Singapore.

GONATODES AFFINIS (Stol.).

Gymnodactylus affinis, Boulenger, Cat. Liz. i. p. 42; S. S. Flower, P. Z. S. 1896, p. 862.

Gonatordes penangensis, S. S. Flower, P. Z. S. 1896, p. 863, pl. xlv. fig. 1.

Gonatordes affinis, id. P. Z. S. 1898, p. 455; id. P. Z. S. 1899, p. 627.

I found this species common on Gunong Inas between 3000 and 4000 ft., where it was the only lizard I came across except a *Draco* that I could not catch. I collected about half-a-dozen specimens amongst boulders on the course of a small stream, these were all of small size, and I saw several others none of which appeared to be larger than the individuals I caught. The measurements of one of these are:—

Breadth of head.....	7 mm.
Length of head	11 "
" body	30 "
" tail	38 "
" fore limb	14 "
" hind limb	15 "

On the other hand, a specimen taken some two thousand feet lower down was approximately of the size of the specimen figured by Capt. Flower (*loc. cit.*) and by Stoliczka (Journ. As. Soc. Bengal, xxxix. 1870, pl. x. fig. 1), but two others from about the same level agreed in size with my smaller specimens. The measurements of the large specimen are:—

Breadth of head.....	10·5 mm.
Length of head	16 "
" body	42 "
" tail	65 "
" fore limb	22 "
" hind limb	38 "

HEMIDACTYLUS FRENATUS (Schleg.).

Hemidactylus frenatus, Boulenger, Cat. Liz. i. p. 120; id. Faun. Brit. Ind., Rept. p. 85; S. S. Flower, P. Z. S. 1899, p. 629.

Khota Bharu, Kelantan. In houses.

Ulu Selama, Perak. Under the bark of dead trees.

HEMIDACTYLUS GARNOTI Dum. & Bibr.

Hemidactylus garnotii, Boulenger, Cat. Liz. i. p. 141; id. Faun. Brit. Ind., Rept. p. 94.

Two specimens were caught inside our house at Kuala Aring. This species has not, I believe, been recorded previously from the Peninsula.

HEMIDACTYLUS PLATYURUS (Schneid.).

Hemidactylus platyurus, Boulenger, Cat. Liz. i. p. 143; id. Faun. Brit. Ind., Rept. p. 95; S. S. Flower, P. Z. S. 1899, p. 629.

Very abundant in Khota Baru, Kelantan, Tringganu, Singapore, and at Bangkok.

GEHYRA MUTILATA (Wiegman).

Gehyra mutilata, Boulenger, Cat. Liz. i. p. 148; id. Faun. Brit. Ind., Rept. p. 96; S. S. Flower, P. Z. S. 1896, p. 866; id. P. Z. S. 1899, p. 630.

Khota Baru, Kelantan, inside houses. Singapore, in Botanical Gardens.

GECKO VERTICILLATUS (Laur.).

Gecko verticillatus, Boulenger, Cat. Liz. i. p. 183; id. Faun. Brit. Ind., Rept. p. 102; S. S. Flower, P. Z. S. 1899, p. 631.

Common in Singgora and as far south as Patani, rare at Khota Baru, Kelantan, and apparently unknown farther south along the E. coast. The specimens recorded by Dr. Hanitsch from Singapore were, I am inclined to suppose, accidentally introduced. In the Peninsula this species does not inhabit houses. If, however, one is set at liberty in a house it will often remain about the place.

GECKO STENTOR (Cantor).

Gecko stentor, Boulenger, Cat. Liz. i. p. 184; id. Faun. Brit. Ind., Rept. p. 103; S. S. Flower, P. Z. S. 1899, p. 634.

This is essentially a forest-haunting species and its loud barking cry is not unfrequently to be heard in the up-country jungle, although the lizard is but seldom seen. I have heard its cry "tok-tok-tok" repeated six or seven times and ending in a harsh chuckle several times, but never saw the beast alive myself. Mr. Annandale obtained two specimens, both males, one at Biserat, the second at Kuala Aring. The former was mature and had 11 pre-anal pores, the latter, a younger specimen, had only 9. Its head too was much more flattened than that of the adult individual. It was caught in a dead bamboo.

GECKO MONARCHUS (Schlegel).

Gecko monarchus, Boulenger, Cat. Liz. i. p. 187; id. Faun. Brit. Ind., Rept. p. 103; S. S. Flower, P. Z. S. 1899, p. 868.

Khota Bharu, Kelantan; Singapore.

Fam. AGAMIDÆ.

DRACO FORMOSUS Blgr.

Draco formosus, Boulenger, A. M. N. H. (7) vi. p. 190 (1900).

A Malay in Penang sold me a specimen of this lizard (♂), preserved in spirit along with a number of specimens of *D. volans*. He assured me that he had caught it on the island, but had never seen another like it.

Length of head	17 mm.
" body	84 "
" tail	160 "
" fore limb	37 "
" hind limb	50 "
Breadth of head	12 "

DRACO MELANOPOGON Blgr.

Draco melanopogon, Boulenger, Cat. Liz. iii. p. 492; Hanitsch, Rep. Raffles Libr. & Mus. 1897, p. 9; S. S. Flower, P. Z. S. 1899, p. 637.

This species is common in the forest of the Ulu Selama district up to about 1000 ft. above sea-level. I caught three specimens, two females and a male. One of the females contained three large eggs. At a height of some 3500 ft. above sea-level on Gunong Inas, I saw two or three Flying Lizards belonging to another, smaller species, but could not capture any.

DRACO VOLANS L.

Draco volans, Boulenger, Cat. Liz. i. p. 256; S. S. Flower, P. Z. S. 1896, p. 868; id. P. Z. S. 1899, p. 636.

This lizard is very generally distributed all over the low-lying country, and we obtained a considerable number of specimens at Kuala Aring, Tringganu, Penang, and elsewhere. Mr. Ridley tells me that the longest flight of one of these lizards he has measured was about twenty-five yards; in the course of this flight it descended from a height of fifteen yards to the ground. They appear to have some power of avoiding obstacles in their flight. Females of this species contained two eggs, or in one instance three.

APHANIOTIS FUSCA Peters.

Aphaniotis fusca, Boulenger, Cat. Liz. i. p. 274; S. S. Flower, P. Z. S. 1899, p. 637.

We collected three young specimens of this lizard on the E. side of the Peninsula, and one young and three adults (2 ♂, 1 ♀) at the foot of Gunong Inas in Perak. The adult male, which I caught myself, was hiding under a large dead palm-spathe; the other adults, a pair, were caught sitting on a branch of a fallen tree. They seem to be rather sluggish little creatures, but are very difficult to see on the ground on account of their coloration. The inside of the mouth in our adult specimens was of a curious blue colour.

GONYOCEPHALUS BORNEENSIS (Schleg.).

Gonyocephalus borneensis, Boulenger, Cat. Liz. i. p. 288; S. S. Flower, P. Z. S. 1899, p. 637.

A single young specimen from the foot of Gunong Inas.

CALOTES CRISTATELLUS (Kuhl).

Calotes cristatellus, Boulenger, Cat. Liz. i. p. 316; id. Faun. Brit. Ind., Rept. p. 134; S. S. Flower, P. Z. S. 1896, p. 871; id. P. Z. S. 1899, p. 639.

This species, exceedingly common in the south of the Peninsula, becomes rarer towards the north, where it is replaced by *C. versicolor*. We collected specimens at Biserat, in Singapore, Penang, and Perak. A pair from Biserat, apparently sexually mature, were

exceedingly small. The measurements of the female of this pair are :—

Length of head	24·5 mm.
„ body	58 „
„ tail	230 „
„ fore limb.....	40 „
„ hind limb	75 „
Breadth of head	14 „

The female lays two spindle-shaped eggs, which are left uncovered in any shady place.

CALOTES VERSICOLOR (Dand.).

Calotes versicolor, Boulenger, Cat. Liz. i. p. 321 ; id. Faun. Brit. Ind., Rept. p. 135, fig. p. 136 ; S. S. Flower, P. Z. S. 1876, p. 572.

Note by Mr. Annandale :—“The male of this species dances in a conspicuous position before the female, which remains concealed. He is then of a pale yellowish flesh-colour, with a conspicuous black smudge on each side of the gular pouch, which is much dilated. He stands with the fore part of the body raised on the fore legs, and bows his head slowly and repeatedly, opening and shutting his mouth continually ; after a time he advances a few steps towards the female and repeats the performance. If disturbed the black marks disappear. The males fight very readily with one another, and change colour as they do so ; the victor becomes of a warm reddish brown. This species is common as far south as Biserat, less so in Raman, and I did not meet with it at all farther south.”

CALOTES EMMA Gray.

Calotes emma, Boulenger, Cat. Liz. i. p. 324, pl. xxv. fig. 1 ; id. Faun. Brit. Ind., Rept. p. 137 ; S. S. Flower, P. Z. S. 1899, p. 641.

This species is fairly common at Patalung, but grows rarer towards the south, and probably does not range beyond Patani.

LIOLEPIS BELLII (Gray).

Liolepis bellii, Boulenger, Cat. Liz. i. p. 403.

Liolepis belliana, id. Faun. Brit. Ind., Rept. p. 156.

Liolepis bellii, S. S. Flower, P. Z. S. 1899, p. 642.

Mr. Annandale has given me the following notes concerning this species :—“The commonest species of lizard in the barren stretches of sand which are common in Lower Siam near the sea-coast, on the east side of the Peninsula. It is exceedingly active and very timid. Though its colour is brilliant, the green and grey ‘eyes’ which ornament its back, and the orange and purple stripes on its side, are not conspicuous amidst its natural surroundings : the former harmonizing with the shadows cast on the sand by the scanty vegetation which it supports ; the latter are more or less concealed by the fold into which the skin that covers the ribs naturally falls. When the male, which is more brilliant than

the female, is roughly handled, and is prevented from using its powerful jaws, it flattens its body in such a way that the stripes of colour on the sides become most conspicuous. The female is unable to do this with such effect, as her ribs seem to be less mobile. *Lirolepis* lives in holes in the ground, which often go down vertically for two feet before there is a bend in their course. The Malays say that the holes are dug by the lizard with the aid of claws and snout, but *Lirolepis* is so timid that I have never been able to watch one digging. A male and female were generally captured in each burrow, and the natives assured me that the lizard is strictly monogamous." A female I opened contained eight large eggs with leathery shells. In the stomach of another specimen I found remains of a large spider, several grasshoppers, and a quantity of vegetable food.

Malay name, "Bewak pasir" (sand-lizard).

Fam. VARANIDÆ.

Two large species belonging to this family are common in suitable localities all over the Peninsula. These are *Varanus salvator* and *V. nebulosus*. Mr. Annandale has given me the following note concerning these species:—" *V. salvator* is perhaps more aquatic than *V. nebulosus*, otherwise their habits appear to be identical and they are equally at home in water, on land, or amongst the branches of trees. They lay their eggs in hollow tree-trunks. When in the water they swim beneath the surface, their legs closely applied to their sides; the powerful tail functions both as a propeller and as a rudder. Their food is very varied. In the States of Patalung and Singgora, in which the Siamese practise a form of tree-burial, these great lizards are accused, and probably with justice, of devouring the corpses. I have disturbed a large monitor eating the body of one of its own kind which had evidently been dead for some days; another when chased dropped from its mouth a small flying-squirrel (*Sciuropterus*); a third, which I dissected, had swallowed a small tortoise the carapace of which had been broken into innumerable little fragments; the stomachs of several others contained nothing but dung-beetles, for which *Varani* may often be seen hunting, turning over the dung of elephants or buffaloes with its fore feet."

I have watched a small *V. salvator* eating a rat in the Botanical Gardens at Singapore. It shook the rat very violently, banging it against the walls of its cage and on the ground, then bit it all over, until presumably all the rat's bones were broken, then bolted it head first. They may sometimes lay their eggs in burrows. A specimen at Kuala Aring lived in a very long and deep burrow, so deep that we could not dig it out. In and near Tringganu they are especially plentiful near the burial grounds.

VARANUS SALVATOR Laur.

Varanus salvator, Boulenger, Cat. Liz. ii. p. 314; id. Faun. PROC. ZOOLOG. SOC.—1901, VOL. I. No. XXI.

Brit. Ind., Rept. p. 166, fig. p. 162; S. S. Flower, P. Z. S. 1899, p. 873.

Our largest specimen measured 6 ft. 6 in. in total length.

VARANUS NEBULOSUS Gray.

Varanus nebulosus, Boulenger, Cat. Liz. ii. p. 311; id. Faun. Brit. Ind., Rept. p. 165; S. S. Flower, P. Z. S. 1899, p. 643.

VARANUS RUDICOLLIS Gray.

Varanus rudicollis, Boulenger, Cat. Liz. ii. p. 313; S. S. Flower, P. Z. S. 1899, p. 643.

A specimen of this lizard was brought to me at the foot of Gunong Inas. It appears to be an inhabitant of forest country only.

Fam. LACERTIDÆ.

TACHYDROMUS SEXLINEATUS Daud.

Tachydromus sexlineatus, Boulenger, Cat. Liz. iii. p. 4; id. Faun. Brit. Ind., Rept. p. 169; S. S. Flower, P. Z. S. 1899, p. 644.

Mr. Annandale tells me that this lizard is common at Biserat, where it is called "Bengkarong Ular" or snake-lizard. It runs about on the top of the long buffalo-grass (lalang); apparently the great length of its body, produced chiefly by the remarkable extent of the tail, saves it from breaking the grass or falling through to the ground. When chased it seeks safety by diving, so to speak, down through the grass to the ground. This species has not, I believe, been recorded previously from the Peninsula, although known to occur in Borneo and Burmah.

Fam. SCINCIDÆ.

MABUIA MULTIFASCIATA (Kuhl).

Mabuia multifasciata, Boulenger, Cat. Liz. iii. p. 186; id. Faun. Brit. Ind., Rept. p. 191; S. S. Flower, P. Z. S. 1899, p. 645.

Abundant everywhere, both in the forests and in open country. I have seen one of these Skinks climbing high up on a large forest tree.

LYGOSOMA FLOWERI, sp. n. (sect. *Hinulia*, Gray).

Form moderately slender; limbs well developed, pentadactyle, rather long; adpressed hind limb just reaches axil. Ear-opening moderately large. No auricular lobes. Eye large, its diameter nearly equal to its distance from the end of the snout. Lower eyelid scaly. No supranasals, fronto-parietals distinct, fronto-nasal in contact with rostral; five supra-oculars, 32 scales round the body. Colour: upper surface brown, with a mid-dorsal row of irregular black spots extending to the base of the tail, which is mottled brown and white; the limbs brown and black; lower surfaces brown.

Two specimens from the foot of Gunong Inas : one, very young, I caught running on the trunk of a tree, the other, a female, on the ground ; its dimensions are :—

Length of head	11 mm.
„ body	35 „
„ tail	75 „
„ fore limb	20 „
„ hind limb	20 „
Breadth of head	5 „

I have much pleasure in naming this species after Mr. Stanley Flower, to whose work on the Reptilian fauna of the Malay Peninsula I am much indebted.

LYGOSOMA CHALCIDES (Linn.).

Lygosoma chalcides, Boulenger, Cat. Liz. iii. p. 340 ; S. S. Flower, P. Z. S. 1899, p. 652.

Malay name, “ Ular Berkaki ” or legged snake.

Specimens were collected at Ban Kong Rah in Patalung and at Khota Bharu, Raman. The natives regard it as the young of *Typhlops* or *Cylindrophis*, and say that its legs gradually grow smaller and smaller until they finally disappear.

3. On the Pterylosis of the Giant Humming-bird (*Patagona gigas*). By Professor D'ARCY WENTWORTH THOMPSON, C.B., F.Z.S.

[Received April 2, 1901.]

(Text-figures 77–82.)

Our knowledge of the pterylosis of the Humming-birds is extremely scanty. It is based mainly on Nitzsch's very brief notes, supplemented by some observations of Dr. Shufeldt's. Nitzsch's very elementary figures are the only ones that I am acquainted with. The following account is based on the examination of a spirit-specimen of *Patagona* received lately by the Museum of University College, Dundee, from Mr. Alexander Rodger of the Perth Museum.

THE PTERYLOSIS OF THE HEAD.

The feathering of the head may be most simply described as starting backwards from the base of the bill in three lateral lines and a median ventral one. The three lateral lines start respectively (a) from the base of the upper mandible, above the nasal flap or cover ; (b) from the neighbourhood of the nostril below the level of its cover ; (c) from below the gape parallel to the line of the jaw.

The upper lateral band (a), corresponding to the fronto-parietal area of Pycraft, forms a closely feathered triangle (text-fig. 77, fr.tr.) over and behind the nasal valve, after which it narrows so as to leave a moderately wide space in front of and over the eye ; then, the interspaces between its feathers becoming much wider,